Alex Squires

West Virginia University
Mechanical and Aerospace Engineering/Bachelors of Science/May 2012
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Arctic Regional Communications Small Satellite (ARCSat)

The Arctic is increasingly important to US economic and national security as manifested by the issuance of a National Security Policy Directive on the Arctic by the White House (NSDD-25). However, the level of activity projected for the region exceeds the infrastructure capacity of the region. To address this issue, a HSV Team consisting of VCSI, MSFC, EUCOM and Dynetics has framed low cost, regional communications systems to address emerging user operational requirements and to validate some emerging technologies. Referred to as ARCSat, this project would capitalize on the already deployed FASTSat microsat, the on-going Arctic Collaborative Environment Project and the NOAA HIRAD Project and provide a critical capability to the Arctic Region of the globe. The current mission concept involves one MicroSatellite or Mothership and four communications CubeSats which would fly in formation as a phased array antennae.. The Mothership would be launched from Kodiak, Alaska on either an Athena or Minotaur rocket. The Mothership would serve as the com and data management center and it would deploy the four CubeSats with advanced software defined radios with capabilities far in excess of the current Iridium system. By providing this over the horizon communications capability, end users can pick up information being transmitted from the ground and relay it to the Mothership which then relays the signals back to a ground station.

Research and Experience

- **Marshall Space Flight Center**, USRP intern, Fall 2009
  EV92 Branch; Ares I upper stage ascent timeline generation, Ares I upper stage ascent abort sequence, and Ares I wikis
- **West Virginia University,** Microgravity Research, Morgantown, WV, 8/2010 – 6/2012
  Team Lead; Designed and proposed experiments to be performed in microgravity, upon acceptance built the experiments then went to Johnson Space Center as flight crew to fly them, First year – Electromagnetically Enhanced Fluidized Bed in microgravity, Second year – Electrostatically Enhanced Fluidized Bed in microgravity
- **West Virginia University,** Satellite Design Team, Morgantown, WV, 1/2012 – 5/2012
  Structures and mechanisms, ballistic probe design, thermal control, designed a satellite mission to study 18 different near earth asteroids and determine the composition and map them, presented mission and satellite design to panel of NASA judges

Memberships and Activities

Team lead for the West Virginia University Microgravity Research Team, Vice president of Mountaineers for student AIDS awareness

Honors, Awards

Dean's List 8 semesters, Promise Scholarship, Nominated by University to attend Korea University in Fall 2012